Your Friends at Tallgrass Prairie National Preserve

Table of Contents

How to Get Started

Tallgrass Prairie National Preserve wants you and your classroom to experience some of the extraordinary educational opportunities of your national parks. Your Friends at Tallgrass Prairie is an introduction to some of the unique resources of your neighborhood national park. It is also an introduction to the National Park Service and the dedicated people who serve its mission.

Materials contained in this kit are geared toward grades 2-4 and correlated to Kansas State Education Standards for those levels. However, you may use the materials in the trunk and this booklet as you deem appropriate for your students.

References to items from trunk will be in **bold print and underlined**. Graphics with a Figure Number referenced will have accompanying transparencies and digital versions on the CD. Watch for the following symbols to help guide you through the booklet:

Indicates a class discussion point and potential writing activity.

Indicates further resources on the Web for extension learning.

Math Counts! Exercise for mental or written arithmetic.

Vocabulary Counts! New vocabulary that may need reinforcement.

Community Counts! Opportunity for verbal interaction with community members.

Please help us continue to share these treasures with other students by treating the trunk contents with respect.

Good luck and enjoy!

All questions, comments, and suggestions are welcome and should be forwarded to:

Travelling Trunk Program
Tallgrass Prairie NPRES
Route 1 Box 14, Hwy 177
Strong City, KS 66869
(620)273-8494

Curriculum Standards (Kansas)

The activities and materials in this trunk have been compiled to meet curriculum standards for the State of Kansas Department of Education.

Lang Arts	**Std**	**Bench mark**	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Reading	1	1					●		
	1	2					●		
	1	4		●			●		
Writing	3	8					●		
Math	**Std**	**Bench mark**	**A**	**B**	**C**	**D**	**E**	**F**	**G**
# and Comp	1	3						●	
	1	4						●	
Geometry	3	1						●	
	3	2						●	
Science	**Std**	**Bench mark**	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Science as Inquiry	1	1			●				
Physical Science	2	1		●		●			
Life Science	3	1			●				
Earth and Space Science	4	1				●			
History and Nature of Science	7	1			●				
Social Studies	**Std**	**Bench mark**	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Civics-Govt		2							●
		5							**● (2nd grade)**
Economics		1				●			
Geography		1						●	
		4		●					
		5				●			
History		1		●					
		2		●				●	
		3	●	●					
		4					●		
Visual Art	**Std**	**Bench mark**	**A**	**B**	**C**	**D**	**E**	**F**	**G**
	3	2	●						
	4	1		●					
	4	2		●					
	4	3		●					

Curriculum Standards (National)

National Center for History in the Schools	Standard 1A: The student undertands family life now and in the recent past; family life in various places long ago. Standard 1B: The student understands the different ways people of diverse racial, religious, and ethnic groups, and of various national origins have transmitted their beliefs and values. Standard 2A: The student understands the history of his or her local community. Standard 2B: The student understands how communities in North America varied long ago. Standard 3A: The student understands the history of indigenous people who first lived in his or her state or region. Standard 3E: The student understands the ideas that were significant in the development of the state and that helped to forge its unique identity. Standard 4E: The student understands national symbols through which American values and principles are expressed. Standard 6A: The student understands folklore and other cultural contributions from various regions of the United States and how they help to form a national heritage.
National Science Education Standards	Standard A (Science as Inquiry): Abilities necessary to do scientific inquiry, Understanding about scientific inquiry. Standard B (Physical Science): Properties of objects and materials Standard C (Life Science): The characteristics of organisms, Organisms and environments Standard D (Earth and Space Science): Properties of earth materials Standard G (History and Nature of Science): Science as a human endeavor.
National Council of Teachers of Mathematics	Understand meanings of operations and how they relate to one another. Compute fluently and make reasonable estimates. Analyze characteristics and properties of two dimensional geometric shapes and develop mathematical arguments about geometric relationships. Specify locations and describe spatial relationships using coordinate geometry and other representational systems. Understand measurable attributes of objects and the units, systems, and processes of measurement.

National Council of Teachers of English

Apply appropriate techniques, tools, and formulas to determine measurements.

Standard 1: Students read a wide range of print and non-print texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world; to acquire new information; to respond to the needs and demands of society and the workplace; and for personal fulfillment.

Standard 3: Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts.

Standard 6: Students apply knowledge of language structure, language conventions (e.g., spelling and punctuation), media techniques, figurative language, and genre to create, critique, and discuss print and non-print texts.

Lesson A: What is a National Park?

Objectives:

- Students will learn the history of the National Park Service.
- Students will explore the meanings of symbols.
- Students will be introduced to the various jobs of National Park Service Rangers.

Materials:

_____ Felt pieces (5 in bag + white board)
_____ Map of National Park System
_____ Flat hat
_____ Ranger Activity and Sticker Book

Curriculum Standards:

- History B3
"The student understands the significance of events, holidays, documents, and symbols that are important to Kansas, United States, and World history."
- Visual Arts Standard 3
"Choosing and evaluating a range of subject matter, symbols, and ideas."

Welcome to Tallgrass Prairie National Preserve!

My name is Ranger Steve and I am the superintendent for the park. My job is to make sure that everything runs smoothly, kind of like your school's principal. Part of my job is to help people understand what the National Park Service does and why.

Community Counts! What does your principal do? Arrange an interview to find out his or her role.

Some of the first park rangers were African-American soldiers! Learn about the story of the buffalo soldiers in Yosemite and Colonel Charles Young in Sequoia, the first African-American superintendent! http://shadowsoldier.wilderness.net

The first national park was Yellowstone National Park created in 1872. Then came others like Sequoia, General Grant, and Yosemite. For many years, this country set aside special places we called national parks, but there was no one to help take care of them. Imagine your town without any police, firefighters, schools, hospitals, or trash collectors! Sometimes, soldiers from the U.S. Army worked in the parks, but there were always too few of them. Only a handful of rangers might be assigned to protect an area the size of the state of Rhode Island! Poachers, timber harvesters, and sheep herders illegally stole resources from these lands and there was nobody in the government who could stand up for the interests of the national parks.

(Figure A1)

Math counts! How many years has the National Park Service existed?

Over 40 years passed before the National Park Service (NPS) was created in 1916. Today there are 390 units of the National Park system! Some parks are huge, some are tiny. Some parks protect nature, some protect historical places. Some even protect *ideas*. No matter what kind of story they tell, all national parks are special places that are part of our American heritage.

Display the **Map of the National Park System**. How many national park sites are there in your state? Have you visited any of them? What did you learn there?

Today, the symbol of the NPS is called the "Arrowhead." Everything shown on the arrowhead represents something that the National Park Service protects. Can you find a picture of something in nature on the arrowhead? Can you find something historical? (Hint: Look at the shape itself!)

(Figure A2)

The shape of the arrowhead is symbolic of cultural resources and the human story of national parks. These resources may be ancient like stone tools and cliff dwellings, or they may be modern like the up coming Flight 93 National Memorial in Pennsylvania.

The giant sequoia tree is the largest tree on Earth. National Parks are places that often protect the superlatives of our country (the biggest, the tallest, the first, etc.)

The snow-capped mountain depicts the majestic scenery of many of the first western national parks. Places like Yellowstone and the Grand Canyon became national parks in part to protect their scenic beauty.

Water resources are important to all living things and the National Park Service plays an important role in protecting clean water supplies for humans, wildlife, and plants.

The forests depicted at the base of the mountain show the National Park Service's committment to forests and ecosystems as a whole.

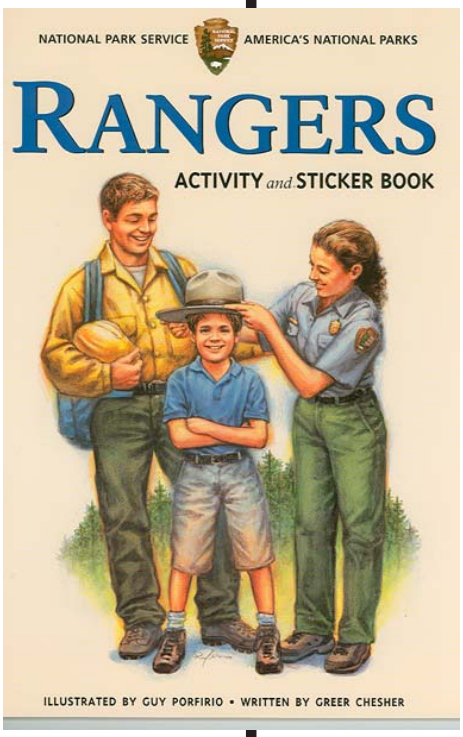
The bison is emblematic of wildlife resources protected in national parks. Yellowstone National Park, for many years, protected some of the last bison remaining in this country.

Reconstruct the arrowhead using the **felt pieces**. What kinds of pictures or shapes would you include if you made a symbol for you, your family, your school, or your town? Try it out!

Check each element's significance at: http://www.netstate.com/states/symb/seals/ks_seal.htm

Even the State of Kansas has a symbol of its own! What symbols are present on this state's seal? What do you think they mean?

(Figure A3)



It takes a lot of work to protect so many special places! Not only do national park rangers take care of the parks and keep them safe, but they also learn from parks and help teach others. Check out the **Ranger Activity and Sticker Book** included in the trunk to learn more about some of the many kinds of park rangers.

Today you'll meet some of the rangers that take care of Tallgrass Prairie National Preserve – a national park right in your backyard!

Lesson B: Stories from the Past

Objectives:

- Students will be introduced to the various methods of historical research and develop historical thinking skills.
- Students will understand that Kansas has a rich human history going back thousands of years.
- Students will be introduced to archaeological thinking skills.

Materials:

_____ Stone arrowhead
_____ Tape "The Buffalo Hunt"

Curriculum Standards:

- Physical Science B1
"Students will develop skills to describe objects."
- Reading B4
"The student comprehends a variety of texts."
- Geography B4
"The student understands how economic, political, cultural, and social processes interact to shape patterns of human populations, interdependence, cooperation, and conflict."
- History B1
"The student understands the significance of important individuals and major developments in history."
- History B2
"The student understands the importance of experiences of groups of people who have contributed to the richness of our heritage."
- History B3
"The student understands the significance of events, holidays, documents, and symbols that are important to Kansas, United States, and World history."
- Visual Arts Standard 4
"Understanding the visual arts in relation to history and cultures."

Hello! My name is Ranger Heather! My job is to help visitors to Tallgrass Prairie National Preserve understand what they see around them. This place is like a book and I am the storyteller. Many people come here to learn about things that they can see in front of them – the grasses, the flowers, the buildings, and the animals. But, there are many chapters in our book about things and people that we cannot see today in the preserve.

Long before it became a National Park, this land was inhabited by people who scientists believe lived on this prairie for almost 10,000 years! When white settlers arrived to explore and live on the prairie, they found a tribe of American Indians who were called the Kansa. Along with the Kansa, neighboring tribes of Pawnee, Osage, and Wichita Indians also lived and hunted on this land. What happened to them all? As the white frontier pushed westward, the American Indians were forced to move. The Kansa were forced onto a reservation in Council Grove. Then, they were forced to move to Oklahoma. Within 30 years of white settlement, there was not a single Kansa Indian left in the state which now bears its name.

Only 15 minutes from Tallgrass Prairie National Preserve is the historic Kaw Mission in Council Grove. Learn more about the Kansa Indians on the web at: http://www.kshs.org/places/kawmission/

Vocabulary Counts! *Reservation*

What would it be like to move thousands of miles away from your home? What kinds of adjustments would you have to make? Is it ever fair to ask a group of people to leave?

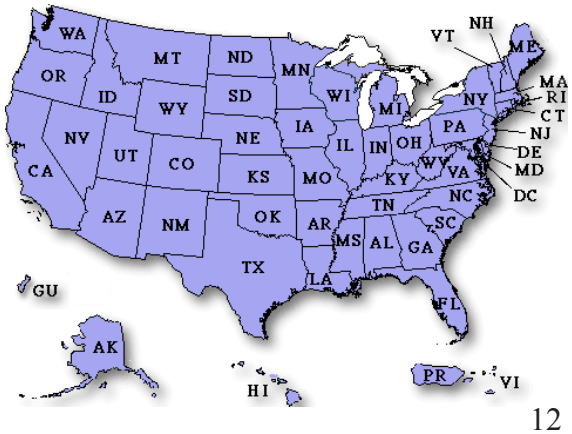
Math Counts! Here is the population of Kansa Indians according to the United States Indian Office:

1843: 1,588
1905: 209

How many were lost? Bonus: What percentage of the population was lost?

Do you know any other states which are named after Indian words?

(See the following pages for examples)



Alabama	Indian for tribal town, later a tribe (Alabamas or Alibamons) of the Creek confederacy.
Alaska	Russian version of Aleutian (Eskimo) word, alakshak, for "peninsula," "great lands," or "land that is not an island."
Arizona	Spanish version of Pima Indian word for "little spring place," or Aztec arizuma, meaning "silver-bearing."
Arkansas	French variant of Quapaw, a Siouan people meaning "downstream people."
Connecticut	From Mohican and other Algonquin words meaning "long river place."
Hawaii	Possibly derived from native word for homeland, Hawaiki or Owhyhee.
Idaho	A coined name with an invented Indian meaning: "gem of the mountains;" originally suggested for the Pike's Peak mining territory (Colorado), then applied to the new mining territory of the Pacific Northwest. Another theory suggests Idaho may be a Kiowa Apache term for the Comanche.
Illinois	French for Illini or land of Illini, Algonquin word meaning men or warriors.
Indiana	Means "land of the Indians."
Iowa	Indian word variously translated as "one who puts to sleep" or "beautiful land."
Kansas	Sioux word for "south wind people."
Kentucky	Indian word variously translated as "dark and bloody ground," "meadow land" and "land of tomorrow."
Massachusetts	From Indian tribe named after "large hill place" identified by Capt. John Smith as being near Milton, Mass.
Michigan	From Chippewa words *mici gama* meaning "great water," after the lake of the same name.

Minnesota	From Dakota Sioux word meaning “cloudy water” or “sky-tinted water” of the Minnesota River.
Mississippi	Probably Chippewa; *mici zibi*, “great river” or “gathering-in of all the waters.” Also: Algonquin word, “Messipi.”
Missouri	An Algonquin Indian term meaning “river of the big canoes.”
Nebraska	From Omaha or Otos Indian word meaning “broad water” or “flat river,” describing the Platte River.
North and South Dakota	Dakota is Sioux for friend or ally.

Storytellers like me use many different skills to figure out what life was like for the Kansa Indians. Some details about the life of the Kansa Indians were recorded by historians in written word long ago.

Read the following passage. What do you think is being described here? Do you think it is accurate?

"Here each hunter sprang in haste from the tired animal he had ridden, and leaped upon the fresh horse he had brought with him. There was not a saddle or bridle in the whole party. A piece of buffalo robe, girthed over the horses's back, served in place of one, and a cord of twisted hair, lashed around his lower jaw, answered for the other. Eagle feathers dangled from every mane and tail, as marks of courage and speed. As for the rider, he wore no other clothing than a light cincture at his waist, and pair of moccasins. He had a heavy whip, with a handle of solid elk-horn, and a lash of knotted bull-hide, fastened to his wrist by a band. His bow was in his hand, and his quiver of otter or panther skin hung at his shoulder...

...At that moment each hunter as if by a common impulse, vio - lently struck his horse, each horse sprang forward, and...we all rushed headlong upon the buffalo. We were among them in an instant. Amid the trampling and the yells I could see their dark figures running hither and thither through clouds of dust, and the horsemen darting in pursuit...

...The uproar and confusion lasted but a moment. The dust cleared away, and the buffalo could be seen scattering from a common center...while behind them followed the Indians, riding at furious speed, and yelling as they launched arrow after arrow into their sides."

Francis Parkman, 1846

(From The Buffalo, 1970)

Before the days when cameras were lightweight and easy to carry, the details of life long ago were recorded in artwork. George Catlin was an artist who travelled into the frontier many times during the 19th century to record the lives of the Plains Indians. His work became very well-known for its scenic beauty and human sensitivity. Many people credit George Catlin for raising public support for the protection of the first national parks!

Look at Catlin's portrayal of the buffalo hunt. How is it different from the passage you read? How is it similar? Which do you think is more descriptive? Which do you think is more accurate?

(Figure B1)

Check out Campfire Stories with George Catlin, an interactive site which includes music, images, and interviews: http://catlinclassroom.si.edu/cl.html

Another way of recording the details of someone's life is to just come out and ask them! Stories are passed down from generation to generation and when they are recorded on tape, it is called an *oral history*.

Interview somebody in your family or in your community about what life was like when he or she was growing up.

Play a segment from the **tape** called "The Buffalo Hunt"

Vocabulary Counts!
Artifact
Observation
Inference

Sometimes we can reconstruct the story of the past by looking at *artifacts*. An artifact is an object that was used by people long ago. We start by *observing*, or looking at, an object and describing it. Then we can make guesses, or *inferences*, about how it may have been used.

Pass around the **stone arrowhead** so that everybody gets a chance to look and feel.

What can you observe (see) about the arrowhead?

Color _____
Shape _____
Texture _____
Size _____
Features _____

Learn more about archaeol - ogy at: http:// www.cr.nps.gov/ archeology/PUBLIC/kids/ index.htm

What are your inferences (guesses) about how it may have been used or made?

Arrowheads in ancient times were made from stone and were shaped by hitting one rock against another. The process of chipping away flakes of rock in order to shape a stone tool is called "flint knapping." Arrowheads were attached to the ends of arrow shafts using a variety of materials including animal sinew, leather straps, or glue. Little notches at the bottom of the arrowhead could be cut in order to make it easier to attach to the shaft of the arrow.

Different shapes and sizes were used for hunting different kinds of animals. A larger, heavier arrowhead would have been needed for larger, heavier animals like deer and elk.

Many local communi- ties have a historical center or library. Check yours out!

How will the details of your lifestyle be recorded? Will you write them down? Draw a picture? Tell them to someone else? Leave behind artifacts? Which method do you think is the most accurate? Why?

Lesson C: Plant Science

Objectives:

- Students will understand the concepts of habitat and biodiversity.
- Students will be introduced to the scientific method and scientific inquiry.

Materials:

_____ PVC frame
_____ Plant press
_____ Pressed plant

Curriculum Standards:

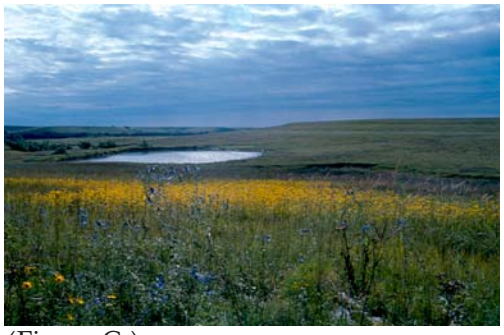
- Science as Inquiry B1
"Students will develop the skills necessary to do full inquiry."
- Life Science B1
"The student will develop knowledge of organisms in their environment."
- History and Nature of Science B1
"The student will develop an awareness that people practice science."

What do you think of when you picture a scientist in a laboratory? Someone in a white coat surrounded by test tubes?

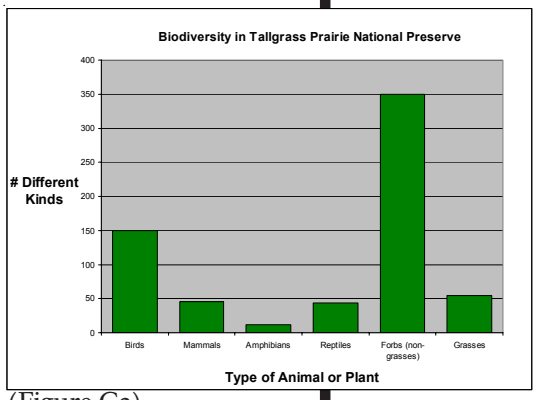
Well, my name is Bio - Tech Billy. I am a scientist for the National Park Service and this is my laboratory! I may not wear a white coat and my laboratory may not be filled with test tubes, but I use all of the same kinds of tools – my eyes, my hands, and my brain. If you have these tools, you can be a scientist, too!

Vocabulary Counts!
Biodiversity
Abundance

Look at this picture. How many different *kinds* of plants do you see? That is called *biodiversity*. Look again at the picture. Which kind of plant occurs the most often? That is called *abundance*.



(Figure C1)



(Figure C2)

Did you know that there are over 400 species of plants in this national park? Almost 60 of these are different kinds of grass! There are also 150 kinds of birds, over 50 kinds of reptiles and amphibians, and as many as 45 kinds of mammals. There are also thousands and thousands of insects!

According to the graph, which kind of organism has the highest biodiversity? Which animal has the highest biodiversity?

How do they all get along together? How is there room for all of them to live and sleep and eat and reproduce? The answer is *habitat*. A habitat is a home. Humans can live in many kinds of habitat like forests, deserts, and cities! Some other animals and plants can live only in one specific kind of habitat like the place where water comes up out of the ground or in the branches of a certain kind of tree. The reason why Tallgrass Prairie has such high biodiversity is partly because there are so many kinds of habitat here!

Vocabulary Counts!
Habitat

Pass around the **PVC frame** from the trunk and let everybody touch and feel.

Vocabulary Counts!
Bias

This frame is a tool we use in science to randomly select a piece of ground to study. In science, it is important to make sure that the scientist's own preferences or biases don't affect the experiment. We just toss the frame into the prairie and wherever it lands—that's our study site!

Let's try it in your schoolyard! Make your own frame by bending a wire clothes hanger into a circle or cutting out the center of a manila folder. You can make your frame any size you want, but remember these important points:

1) Be consistent. The only thing that should change in your experiment is the location of the site -- not the size or type of your instruments.
2) The bigger the area, the more plants you'll count. This means more data (and also more work!)

Math Counts! If your hoop has a diameter of 1 meter, what is the area inside? (Remember, Area = ð * radius^2)

Copy the worksheet from the following page and perform the experiment!

Vocabulary Counts!
Herbarium

The original range of the tallgrass prairie covered over 400 million acres but today less than 4% remains. This makes tallgrass prairie one of the most threatened ecosystems in the world! We try to preserve as many specimens of plants as possible so that we can reference them later. A library of preserved plants is called an *herbarium*.

Pass around the **press** and **pressed plants**.

The best way is to preserve plant specimens is to press them. Not only does the press flatten the specimen and make it easy to store, but it squeezes the water out so that the plant won't rot.

Try your hand at a fancier plant press by following the instructions at: http://www.uen.org/utahlink/pond/buildpress.htm

You can make your own plant press just by putting the plant in some paper between the pages of a heavy book!

Plant Science: Student Worksheet

Scientific experiments always start with a question.
Let's start with this one:

Question: Which site in your schoolyard has the highest biodiversity?

Next, we come up with a hypothesis (guess) about what we think will be the result. What is your hypothesis?

Hypothesis (Guess): Which site do you guess will be the most biodiverse and why?

_____
_____
_____

Pick a few spots in different parts of your school and count how many different *kinds* of plants (biodiversity) you find inside your hoop. Then count the *total number* of plants (abundance) you find inside your hoop.

Site 1: _____ different kinds of plants
_____ total plants

Site 2: _____ different kinds of plants
_____ total plants

Site 3: _____ different kinds of plants
_____ total plants

Results: Which of your sites has the highest biodiversity?

_____
_____
_____

Conclusion: Why do you think you got this result?

_____
_____
_____

Lesson D: Rocks Rock!

Objectives:

- Students will learn the properties and history of limestone.
- Students will be introduced to various fossil types.
- Students will understand how the natural resources of the Flint Hills contributed to the cultural landscape.

Materials:

_____ Limestone
_____ Puzzle pieces
_____ Puzzle guide

Curriculum Standards:

- Economics B1
"The student understands how limited resources require choices."
- Geography B5
"The student understands the effects of interactions between human and physical systems."
- Physical Science B1
"Students will develop skills to describe objects."
- Earth and Space Science B1
"The student will develop an understanding of the properties of earth materials."

Well, hello! I'm Ranger Jim and my job is to take care of everything at Tallgrass Prairie National Preserve that needs maintenance. I take care of the roads, the trails, and the historic buildings. Sometimes I use big heavy equipment like a tractor or a mower. Sometimes I use my own hands!

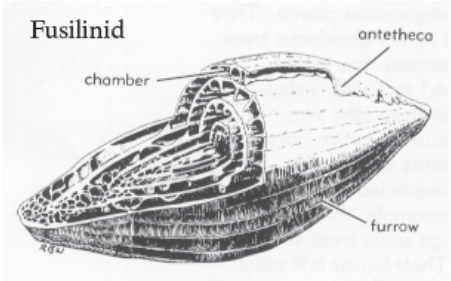
Imagine you lived over 100 years ago and had to build a fence on your property to make sure your cattle didn't escape. This was the law in Kansas! Fortunately for ranch owners like Stephen F. Jones, the original developer of the ranch here at the preserve, the government reimbursed (paid back) landowners for fencing their land. (A unit of fencing was called a "rod" and stretched about 16 1/2 feet.) What would you use to build your fences? It was expensive to get barbed wire out into the prairie back then, so people used *natural resources*. A natural resource is anything that comes from nature that is used by humans. Out on the prairie, wood was a very rare and precious natural resource, so you would want to use something easier to collect and use. In the Flint Hills of Kansas where Tallgrass Prairie National Preserve is today, there are lots and lots of rocks!

Math Counts! If Mr. Jones paid his laborers $0.50 per rod of fencing and got $0.40 per rod of fencing from the government, how much did he *actually* pay per rod? Mr. Jones fenced in about 30 miles of pasture. How much did he have to pay in total?

Vocabulary Counts! *Natural resource*

Learn more about fossils in Kansas by visiting: http://www.kgs.ku.edu/Extension/KSfossils.html

Most of these rocks are **limestone** – a sedimentary rock that geologists think was formed over 250 million years ago at the bottom of a shallow sea! When sea animals die, their bodies sink to the bottom and form a kind of sludge very rich in calcium. Pressure and time eventually turn that lime mud into limestone. Look closely and you may find the remains of ancient sea creatures embedded in pieces of limestone. Most fossils come from small marine animals. Many fossils you'll find in rocks around Tallgrass Prairie National Preserve are tiny one-celled organisms called *fusilinids*. Fossilized fusilinids look like little grains of wheat embedded in the rock.



(Figure D1)

Trilobites are ancient marine animals, related to today's horseshoe crabs. They are arthropods, like insects, and have hard outer bodies which survive the fossilization process. What you find most often in Flint Hills limestone is the fossilized tail of the animal.

Bryozoans are some of the most common fossils seen around the world today. They are tiny animals that live in colonies and excrete calcium carbonate to form an external skeleton. They behave like corals, forming colonies and emerging from their skeletons to collect food.

Crinoids, although they resemble plant life, are animals. In fact, they are echinoderms related to modern starfish and sea urchins. Commonly found are the "stems" of the organism where it attaches itself to the sea floor.

Brachiopods are marine animals that resemble clams. They live in relatively shallow waters. They attach themselves to an object and then pump water in and out of their bodies to extract food.

(Figures D4-D7)

Pass around the **limestone** sample. What kind of fossil can you find? Is it from a plant or animal? Why do you think it is harder to find plant fossils?

Describe the piece of limestone from the trunk

Color _____
Shape _____
Size _____
Weight (light or heavy?) _____
Fossils: How many?
What kind? _____

Draw a picture of your rock.

Learn more about the history of the capitol building by visiting: http://www.kshs.org/places/capitol/

Limestone was valuable as a construction material and almost every building at the Spring Hill Ranch was made from it. Over 30 miles of fencing on the ranch were made from limestone. Even the capitol building in Topeka was made from this same kind of rock!

Vocabulary Counts!
Dry stone masonry

Over 100 years later, some of the original rock walls are falling down and it is my job to help repair them. This is called *dry stone masonry* and it means stacking rocks together without any mortar or glue. When it is done right, walls and buildings can stand for hundreds or even thousands of years! This form of construction has been practiced by almost every culture in the world throughout history.

(Figures D2 & D3)

The trick is to get the rocks to have as much contact with each other as possible. More contact means more friction or stickiness. Sometimes the masons shape the rocks to make them fit better. Sometimes they use only what is available on the ground. It's like putting together a puzzle so that there are no holes. Sounds easy? Try it for yourself!

Reconstruct the rockwall with the **puzzle pieces** from the trunk. Use the **puzzle guide** or try it freehand!

Lesson E: Old School

Objectives:

- Students will learn how a 19th-century one-room schoolhouse operated.
- Students will practice 19th-century literacy lessons.
- Students will understand how family life in the past was both different and similar to family life today.

Materials:

_____ Apron
_____ Sun bonnet
_____ Slate
_____ Chalk
_____ McGuffey's Reader

Curriculum Standards:

- Reading B1
"The student uses skills in alphabetics to construct meaning from text."
- Reading B2
"The student reads fluently."
- Reading B4
"The student comprehends a variety of texts (narrative, expository, technical, and persuasive).
- Writing B8
"The students use standard American English conventions."
- History B4
"The student engages in historical thinking skills."

Hi, my name is Mary Beth and I am a volunteer. It takes a lot of work to maintain a national park and sometimes the rangers need some help getting everything done. Also, it gives me a chance to learn and spend time in a beautiful place. I get to meet people from all over the world when I come to work at Tallgrass Prairie National Preserve! Volunteers like me can help out in lots of different ways like hiking the trails, picking up trash, and doing special projects. I love history so my favorite thing to do is help teach people about what life was like here back in the 1880s.

(Figure E1)

Math Counts! If Mr. Jones had $100,000 to start with, how much did he spend on the house? How much did he have left over?

Stephen F. Jones came to Kansas in 1878 to build the Spring Hill Farm and Stock Ranch. Looking at this picture of his house, do you think he was an average Kansas farmer? No. He was very wealthy and spent about a quarter of his entire fortune on his house alone. In other ways, he and his family's way of life was very traditional for that time. His wife, Louisa, did most of the household cooking and cleaning, and their daughter, Lutie, attended classes at the one-room schoolhouse just up the road.

(Figure E2)

Pass around the articles from the old schoolhouse (**apron, sun bonnet, slate, piece of chalk**) Do you use any of these items in your school today? If not, what do you use instead?

In one-room schoolhouses, oftentimes the older students helped teach the younger ones. Are there opportunities to help younger kids in your community or family?

Imagine Lutie's experience at the Lower Fox Creek Schoolhouse. Teachers were very strict and demanded total silence during lessons. Lutie would've had to stand any time she answered a question in class. The only heat was from the woodstove at the back of the classroom. There was recess and lunch time, too, but there were never more than about twelve students in the entire school. These students would've ranged from kindergarteners to 8th graders.

Would you like to go to a school like this? Why or why not?

The McGuffey's reader was the most popular textbook during most of the 19th century and it is still used in some classrooms today. Lutie probably used this textbook to learn reading, writing, and spelling. It sold over 120 million copies between when it was first published in 1830 and 1961. Only the Bible and Webster's Dictionary come close to that! William H. McGuffey believed that learning to read should include morals and values so that young people could learn good behavior. Reading activities had titles like "The Honest Boy and the Thief" and "The Effects of Rashness."

Ask your school's librarian to recommend his or her favorite books for kids your age.

Trade off reading aloud from the **McGuffey's reader**. Students listening can practice dictation, writing as neatly as possible in cursive letters. See the next pages for more McGuffey activities.

Do you think you would like to learn from this kind of textbook? Why or why not? Do you think that a child's behavior can improve if he or she reads books with morals?

(Figure E3)

Education was very important in order to be successful. By the time Lutie was 15 years old, she had exhausted the educational opportunities of the Lower Fox Creek School. The Joneses picked up and moved to Kansas City so that she could go to high school!

Not everything on the ranch was about hard work, though. Sure, there was plenty of work to be done, but the Jones had time to play and relax, too. Lutie played the piano in the downstairs parlor. Lutie's mother Louisa probably relaxed with handcrafts like crochet and needlework. Stephen Jones may have indulged in a game of horseshoes!

What do you do to relax and have fun? How do you think it may be different from the Jones family?

From the Tallgrass Prairie National Preserve Lower Fox Creek Curriculum Guide (grade 3)

Procedure:

1. Teacher reads selections from McGuffey Reader omitting words and asks students what they think could be the omitted word based on their understanding of the context.
2. Students individually read aloud various portions of text.
3. Students are given several sentences and must arrange them in logical order:
   a. Stephen Jones' daughter, Lutie, attended Lower Fox Creek School. (4)
   b. Stephen Jones built his limestone house in Chase County in 1881. (3)
   c. Stephen Jones was born in Tennessee. (1)
   d. Stephen Jones sold his ranch and moved to Kansas City so Lutie could go to high school. (5)
   e. Before moving to Chase County, Stephen Jones got into the cattle business with his two brothers while living in Texas with his wife, Louisa. (2)
4. Students play the grammar game "Teakettle".

<u>Teakettle Game</u>

The class divides into two teams. One team selects (or is given) a pair of homonyms, such as "horse" and "hoarse". Students take turns using the word or words in a sentence, saying "teakettle" instead of the chosen homonyms. For example, one student may state "The boy who rode the (teakettle) was a little (teakettle)", or "My (teakettle) is a little (teakettle) because he has a cough". The opposing team tries to guess the words. The student who correctly guesses the words must spell the answers. The teams then switch roles. Some useful homonyms:

- night, knight
- son, sun
- pale, pail
- pane, pain
- two, too, to
- their, there, they're
- for, four
- do, dew
- blue, blew
- days, daze
- nose, knows
- knew, new
- know, no

Teakettle Game Sentences

The (teakettle) in shining armor sleeps at (teakettle). [knight/night]

I bought (teakettle) pieces of candy and gave them (teakettle) to my brother. [two/to]

(Teakettle) over (teakettle) with (teakettle) teacher. [They're/there/their]

(Teakettle) you think there is (teakettle) on the grass this morning? [Do/dew]

The wind (teakettle) my (teakettle) hat off. [blew/blue]

I am eating (teakettle) cookies (teakettle) dessert. [four/for]

My (teakettle) (teakettle) that a skunk smells bad. [nose/knows]

My mom (teakettle) that I broke her (teakettle) chair when I jumped on it. [knew/new]

(Teakettle) your name on the (teakettle) side of the paper. [Write/right]

Dad put up an awning to shade his (teakettle) from the hot (teakettle). [son/sun]

I (teakettle) that (teakettle) cheating is allowed in school. [know/no]

Your face looks as (teakettle) as the water in the (teakettle). [pale/pail]

I felt (teakettle) when I crashed through the window (teakettle). [pain/pane]

From the Tallgrass Prairie National Preserve Lower Fox Creek Curriculum Guide (grade 3)

Spelling

Procedure:

1. Select a list of words from McGuffey's Eclectic Spelling Book or from words currently being studied in the classroom.
2. Assign students to copy words and definitions either on slates or in their copybooks and to study each word carefully.
3. Announce there will be a large group activity at the end of the study period using the words in the spelling list.
4. At the end of the study period (15 minutes or so) do the following:

   Spelling Bee

   Students close their Spelling Books and copybooks or erase their slates. All stand. The teacher reads from the assigned list providing correct sentences for each. In turn, the individual student must correctly spell the word from the list. Anyone who fails to spell a word correctly is "out" and must sit down. He or she does not get another turn. The last students standing when all words have been exhausted are the winners and may be awarded a prize if the teacher so desires.

From the Tallgrass Prairie National Preserve Lower Fox Creek Curriculum Guide (grade 3)

Writing

Opening: Explain the importance of good handwriting in an age without computers. Explain how good handwriting (or penmanship) was required for many jobs, including secretarial and bookkeeping positions. It was often the key to employment. *[This would be a great opportunity to show children examples of handwriting from the 1880s (census records, bibles, etc.).]*

Procedure:

1. Practice penmanship using pencil and copybook by forming the cursive letters e, l, i and t.
2. On the last line write as many words as you can that are spelled with only these letters. What words have you written? Can you spell them for me?
3. Have the students write at least three sentences describing today's experience. The teacher will instruct as to who the "audience' is so that students write for that person(s) who knows little or nothing about the Flint Hills of Kansas, about National Parks, etc. (perhaps a cousin in Florida).
4. Have the students use vivid descriptions (adjectives).
5. Students discuss in groups of two or three some of their experiences and ideas before beginning the written exercise.

Extensions:

1. Have the students discuss whether they think handwriting is more or less important today compared to the 1880s. How do we communicate today that is different from the 1880s?

Lesson F: Ranch Math and Maps

Objectives:

- Students will be introduced to "cowboy culture."
- Students will understand the basics of rangeland management and grazing.
- Students will practice mathematical computation and map-reading skills.

Materials:

_____ CD "Songs, Sonnets, and Stories of Old Kansas"
_____ String

Curriculum Standards:

- Numbers and Computation B3
"The student uses computational estimation with whole numbers and money in a variety of situations."
- Numbers and Computation B4
"The student models, performs, and explains computation with whole numbers and money using concrete objects in a variety of situations."
- Geometry B1
"The student recognizes geometric shapes and describes their properties using concrete objects in a variety of situations."
- Geometry B2
"The student estimates and measures using standard and nonstandard units of measure with concrete objects in a variety of situations."
- Geography B1
"The student uses maps, graphic representations, tools, and technologies to locate, use and present information about people, places, and environments."
- History B2
"The student understands the importance of the experiences of groups of people who have contributed to the richness of our heritage."

Howdy! I'm Gene and I work with some of the biggest animals you'll find on Tallgrass Prairie National Preserve these days – cattle. Cattle have been grazing the prairie here in the Flint Hills of Kansas for over 100 years. Cowboy culture is a big part of life around here.

Listen to some of the songs and poems on the CD **Songs, Sonnets, and Stories of Old Kansas**. How do you think this state has been shaped by cowboy culture?

Before there were cows, other animals like bison, elk, and pronghorn antelope grazed here. Prairie grasses are very nutritious for grazing animals like these and, in turn, grazing helps promote new growth on the prairie.

Underground root systems of prairie plants
Heidi Natura, Conservation Research Institute
(Figure F1)

Grass is like hair. No matter how many times you get a haircut, it keeps growing back, right? That is because the growing part, the part that is alive, is down under your skin. Prairie grasses have particularly deep roots, too, which help to keep the plant alive even when the tops are clipped off. Mowing, grazing, and burning all help to stimulate new growth on the prairie.

New growth is very attractive to many kinds of wildlife. American Indians would intentionally burn the prairie so that bison would come the following spring. New growth is delicious to cattle as well. On a typical summer day on the tallgrass prairie, a steer may gain 2-3 pounds just by eating grass! Imagine coming back from summer vacation 200 pounds heavier!

Math Counts! After 90 days of grazing, how many pounds will a steer have gained?

(Figure F2)

Remember, though, that grazing is healthy for the prairie only up until a certain point. If there are too many animals with too little grass, weeds will take over. The loss of one native plant can lead to the loss of 10 to 30 other kinds of insects, animals, and other plants! So, we have to decide how many animals to put onto each pasture and for how long. This is a very difficult decision so ranchers and scientists from both the National Park Service and The Nature Conservancy at Tallgrass Prairie work together to figure out the healthiest option.

On average, two acres of prairie can support one steer.

If the preserve has 10,000 acres of grazable land, how many steers could we put out there?

What if we took 2,000 acres to set aside for bison grazing? How many acres are left? How many steers could we put on that land?

Distribute copies of the Preserve map on the following page.

There may be ranchers in your community or your family. Interview a local rancher to find out how they decide which animals to put where.

A rancher has to know the layout of the pastures so that he or she can decide how many animals to put in which area and for how long. The Preserve is divided into nine separate pastures. Let's look at Windmill Pasture first.

1.) What shape is Windmill Pasture?

2.) Which pasture is directly north of Windmill?

3.) Which pasture is directly east of Windmill?

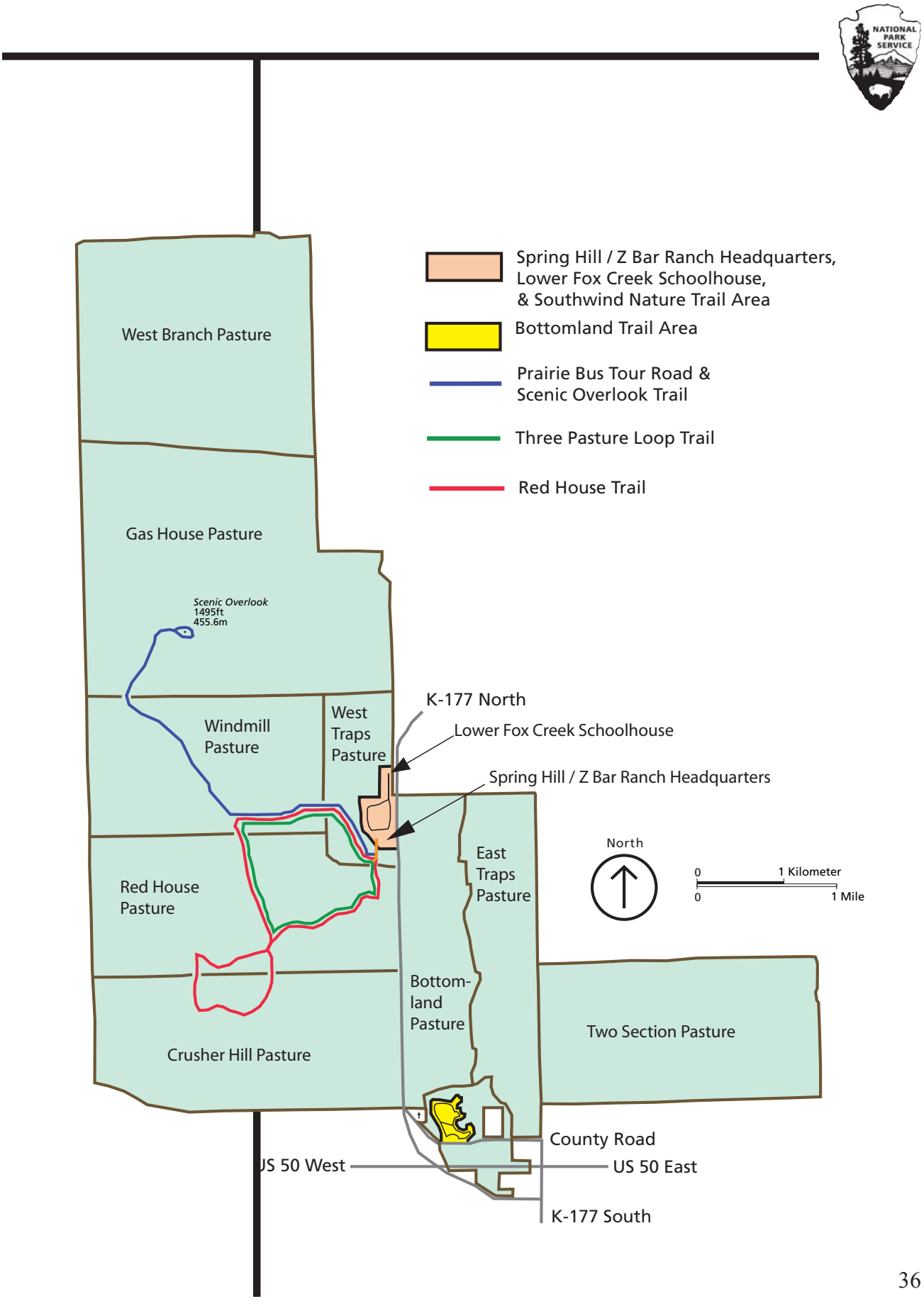
4.) Which pastures are southeast of Windmill?

5.) Using the string, measure the amount of fencing needed to enclose Windmill Pasture. Use the scale to convert this measurement to kilometers.

6.) Windmill Pasture is about 1200 acres. How many cattle could fit on it?

7.) What if we wanted to graze bison at 3 acres per animal? How many bison could fit on Windmill Pasture?

8.) Using the string, measure the three trails. Use the scale to convert this measurement to kilometers. Put the trails in order from shortest to longest. (Remember to keep in mind the roundtrip!)


Spring Hill / Z Bar Ranch Headquarters,
Lower Fox Creek Schoolhouse,
& Southwind Nature Trail Area
Bottomland Trail Area
Prairie Bus Tour Road &
Scenic Overlook Trail
Three Pasture Loop Trail
Red House Trail
West Branch Pasture
Gas House Pasture
Scenic Overlook
1495ft
455.6m
Windmill Pasture
West Traps Pasture
K-177 North
Lower Fox Creek Schoolhouse
Spring Hill / Z Bar Ranch Headquarters
East Traps Pasture
Red House Pasture
Bottom-land Pasture
Two Section Pasture
Crusher Hill Pasture
North
0
1 Kilometer
0
1 Mile
County Road
US 50 West
US 50 East
K-177 South

Lesson G: Working in a Team

Objectives:

- Students will practice teamwork and communication.
- Students will understand the challenges and benefits of working in groups

Materials:

_____ Rope
_____ Blindfolds

Curriculum Standards:

- Civics-Government B2
"The students understands the shared ideals and diversity of American society and political culture."
- Civics-Government B5 (2nd grade)
"demonstrates leadership in the classroom"

My name is Louise and, although I work in this national park, I do not work for the National Park Service. I work for the Kansas Park Trust, one of the partner organizations that help run the Tallgrass Prairie National Preserve. Along with The Nature Conservancy and the National Park Service, we work as a team to keep the tallgrass priairie safe and healthy and accessible for all kinds of people.

What is it like working as a team as opposed to working by yourself? Is it easier? Harder? Do things take longer or do they go faster?

Try this little game. Get into groups of 5 and stand in a circle facing each other. Everybody extend your right arm and grasp the hand of someone else in the circle. Now extend your left arm and grasp the hand of *someone else* in the circle. Now, without letting go, untangle yourselves!

You will have to work as a team and communicate with each other in order to meet this challenge. Be gentle with your classmates. If your arm is twisted or uncomfortable, you may let go to reposition yourself, but do not untie the knot this way.

Once you have met this challenge, try it again with 6 or 7 people to a group. Now try it with 10!

Discuss with your group how it went.

Which strategies worked the best? Why?
Did anyone take the lead?
Did everybody participate equally?

Community Counts! Athletic teams and clubs work well when there is good partnership. Interview a local sports coach or club leader and ask what they do to foster teamwork.

You probably found that communication was an important element of good teamwork. Try this other exercise in communication.

Make a large open space in the middle of the classroom (or use the gym or school yard). **Blindfold** the students. Set the **rope** on the ground and tell the students they are to *slowly* and *gently* find the rope and grab onto it.

Your task is to form the rope into different shapes. Form a triangle first. Try to make it as regular (even-sided) as possible. The group must decide when it thinks it has made a perfect triangle. Take off your blindfolds and look at your results!

Next, try a square! Feeling brave? Try a pentagon!

This is harder than it sounds. Good communication (that means *listening* as well as speaking) will be essential. If you want a real challenge, try this exercise without any speaking at all!

Try some of the other team-building games at http://www.wilderdom.com/games/InitiativeGames.html

When you are done, discuss the results.

Which strategies worked the best? Why?
Did anyone take the lead?
Did everybody participate equally?

Tallgrass Prairie National Preserve is a unique place because we work in a partnership. No one person or one organization gets to make all of the decisions. Instead, we use all of our collective knowledge and experience to make decisions together. You probably do this all the time with your friends, your family, your teammates, or your classmates.

Post - Trunk Activities

Congratulations! You've completed the Your Friends At Tallgrass Prairie travelling trunk! Please fill out the **Evaluation Form** enclosed in the trunk so that we can improve and expand this program.

Try a few of these follow-up activities:

Every place on Earth is unique and so is every person. You've learned a bit about some of the special people who work at Tallgrass Prairie National Preserve, why not share a bit about you and your school? Make a book or put together a trunk of your own to share with other schools in the neighborhood or from all over the world!

There are over 300 national parks in the United States and each has a special story to tell. Pick one from the map and write them a letter. What kinds of rangers do they have there? What kinds of animals and plants and rocks? What are some of the main characters in that park's story?

References and Additional Resources

What is a National Park?

Farabee, Charles R Butch. National Park Ranger: An American Icon. Roberts Rinehart Publishers, 2003. (Grade 9 -adult)

National Parks: An American Legacy. Video (Grade 7 -adult)

Stories From the Past

Catlin, George. George Catlin and His Indian Gallery. Smithsonian American Art Museum, 2002. (All ages)

Goble, Paul. Buffalo Woman. New York: BradburyPress, 1984. (many titles by same author) (Grades K-3)

Haines, Francis. The Buffalo: The Story of American Bison and Their Hunters FromPrehistoric Times to the Present. Norman: University of Oklahoma Press, 1970. (Grade 9-adult)

Unrau, William E. The Kansa Indians: A Historyof the Wind People, 1673-1873. Norman: University of Oklahoma Press, 1971. (Grade 9-adult)

Digital History 2004 <http://www.digitalhistory.uh.edu/>

Library of Congress: American Memory <http://memory.loc.gov/ammem/>

History Matters: A U.S. Survey Course on the Web 1998-2005<http://historymatters.gmu.edu/>

PAKWeb: A WWW Guide to Kansas Archaeology 2005 <http://www.ksarchaeo.info/>

Plant Science

Dvorak Jr., David. A Sea of Grass. New York: Macmillan, 1994. (Grade 2-5)

Carle, Eric. A Tiny Seed. Natick, MA: Picture Book Studio, 1987. (Grade K-3)

Lerner, Carol. Seasons of the Tallgrass Prairie. New York: William Morrow Company, 1980. (Grade 4-8)

Patent, Dorothy Henshaw. Prairies. New York: Holiday House, 1996. (Grade 4-5)

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Wallace, Marianne D. America's Prairies and Grasslands: A Guide to Plants and Animals. Fulcrum Publishing, 2001. (Grade 2-5)

Distance Learning: On the Prairie <http://www.bellmuseum.org/distancelearning/prairie/>

Rocks Rock!	Squire, Ann O. A True Book: Rocks and Minerals. Children's Press, 2002. (Grade K-3) Weller, Francis Ward. Matthew Wheelock's Wall. Atheneum, 1992. (Grade K-3) Thorson, Kristine and Robert. Stone Wall Secrets. Tilbury House Publishers, 2001. (Grade 3-5) Deike, Ruth. Stone Wall Secrets:Exploring Geology in the Classroom: Teacher's Guide.Tilbury House Publishers, 1998.
Old School	Wilder, Laura Ingalls. Little House on the Prairie. Harper Trophy, 1953. (Grade 3-5) (many titles by same author) Avi. Prairie School (I Can Read Book 4). Harper Collins, 2001. (Grade 3-5) Murphy, Jim. My Face to the Wind: The Diary of Sarah Jane Price, A Prairie Teacher, Broken Bow, Nebraska,1881. Scholastic, Inc., 2001. (Grade 3-5) Anderson, William. Pioneer Girl: The Story of Laura Ingalls Wilder. HarperTrophy, 2000. (Grade 3-5) (many titles by same author) http://sites.onlinemac.com/kcampbell/One_Room_Schoolhouses.htm
Ranch Math and Maps	Liebman, Dan. I Want To Be a Cowboy. Firefly Books, Ltd., 1999. (Grade K-3) Gibbons, Gail. Cowboys and Cowgirls: YippeeYay!. Little, Brown, 2003. (Grade K-3)
Working in Teams	Jones, Alanna. Team-Building Activities For Every Group. RecRoom Publishing, 2000. (Grade 9-adult)

Please suggest additional materials in the Evaluation Form!

Inventory

Please take the time to check all of the items in the trunk before and after use. If anything is missing or damaged, please contact us immediately.

Education Coordinator
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National Preserve
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(620) 273-8494
tapr_interpretation@nps.gov

_____ Activity booklet
_____ Photo CD
_____ Transparencies
- _____ Figure A1 (Buffalo Soldiers)
- _____ Figure A2 (NPS Arrowhead)
- _____ Figure A3 (KS seal)
- _____ Figure B1 ("Buffalo Chase" by George Catlin)
- _____ Figure C1 (Tallgrass Prairie landscape)
- _____ Figure C2 (Biodiversity chart)
- _____ Figure D1 (Fusilinid)
- _____ Figure D2 (Parthenon)
- _____ Figure D3 (Pyramids)
- _____ Figure D4 (Trilobite)
- _____ Figure D5 (Bryozoan)
- _____ Figure D6 (Crinoid)
- _____ Figure D7 (Brachiopod)
- _____ Figure E1 (Spring Hill Ranch House)
- _____ Figure E2 (Lower Fox Creek School)
- _____ Figure E3 (School interior)
- _____ Figure F1 (Underground root system of prairie plants)
- _____ Figure F2 (Cattle)

_____ Evaluation Form

Lesson A: What is a National Park?
_____ Felt pieces (5 in bag + board)
_____ Map of National Park System
_____ Flat hat
_____ Ranger Activity and Sticker Book

Lesson B: Stories from the Past
_____ Stone arrowhead
_____ Tape "The Buffalo Hunt"

Lesson C: Plant Science
_____ PVC frame
_____ Plant press
_____ Pressed plant

Lesson D: Rocks Rock!
_____ Limestone
_____ Puzzle pieces
_____ Puzzle guide

Lesson E: Old School
_____ Apron
_____ Sun bonnet
_____ Slate
_____ Chalk
_____ McGuffey's Reader

Lesson F: Ranch Math and Maps
_____ CD "Songs, Sonnets, and Stories of Old Kansas"
_____ String

Lesson G: Working in Teams
_____ Rope
_____ Blindfolds